



X-34 pre-flight test series under way

by Martin Burkey

A new phase of tests to prepare NASA's X-34 experimental rocket plane for flight got under way last month at Dryden Flight Research Center, Edwards Air Force Base, Calif.

The tests involve towing the X-34 technology demonstrator behind a semi-truck and releasing it to coast on the Edwards dry lakebed.

Orbital Sciences Corp., of Dulles, Va., is developing the X-34 technology demonstrator for the Marshall Center.

"The tests, which simulate the vehicle's roll-out after landing, will verify the craft's guidance and navigation system, nose wheel steering, braking, rudder speed brake operation and rudder steering," said Jeff Sexton. Sexton is flight-testing and

See X-34 on page 4



Photo by Doug Stoffer, NASA/Marshall Space Flight Center

Marshall salutes Teachers of the Year

Julia Meuwese, right, the Netherlands' international delegate at the opening ceremonies of the U.S. Space & Rocket Center's 11th annual International Space Camp, presents candy to Center Director Art Stephenson. The ceremony marked the beginning of a weeklong tribute to the International Teachers of the Year.

Space-age ID system

Parts, products tracking taken to new heights

by Sherrie Super

Think of them as bar codes with an attitude.

They're permanent, scannable, sometimes invisible, and they're popping up on items from vitamins to computer chips. They're matrix symbols, first studied for use by NASA in 1987 to help in tracking Space Shuttle components.

"In the space program, we have to track millions and millions of parts — even tiny electrical components no larger than a dime

— to be certain of the integrity of critical systems," said Marshall's Fred Schramm. "We need to know where each part was made, who touches it along the way and when and where it is installed."

This led NASA to study the matrix symbol — technology that takes parts identification to the next level.

At the beginning of the Shuttle program, NASA tracked parts manually. "As the flight rate increased, we were gathering as much information as several large grocery stores each day," said Schramm, manager for engineering application projects for Marshall's Technology Transfer Department. "That created a backlog of paperwork that

took as long as three months to catch up with the finished product."

In the mid-1980s, NASA turned to the bar code system, saving millions of dollars annually through automatic data entry.

"Bar code labels, however, didn't work well on some parts, especially ones that were small," Schramm said. "And a sticky label isn't going to last long on a Shuttle heat tile during the return to Earth. We had to find something that performed like a bar code but would remain readable for the part's full life cycle."

Enter the matrix symbol, capable of

See Bar codes on page 7

"Get Strong on Safety"

— Safety slogan submitted by
Terry Christopher, QS10

Countdown to Safety Bowl

Marshall's Safety Bowl begins Aug. 30 and culminates with the championship on Safety Day, Oct. 25. Teams from each directorate will compete. For more information, call Irene Taylor at 544-2051.

Sample Questions

1. What should NOT be done in an emergency situation?
 - a) Call the local emergency number for help (for example, 9-1-1).
 - b) Move the victim to a safer place if he or she is not in immediate danger.
 - c) Cover the victim with a blanket to keep him or her warm until help arrives.
 - d) If the victim is conscious, ask them personal information. For example, his or her name and where he or she lives, so this can be reported once help arrives.
2. The average number of people who die in the United States each year from being struck by lightning is about
 - a) 10
 - b) 50
 - c) 100
 - d) 1,000
3. Which of the following activities involve repetitive motion?
 - a) Typing on a keyboard
 - b) Filing
 - c) Writing
 - d) Scanning documents
 - e) Using a mouse for graphics or games
 - f) All of the above
4. Injuries often occur when children climb on furniture to see what's happening outside. What's the best way to keep children from becoming entangled in the cords of window blinds and curtains?
 - a) Don't use window blinds or curtains. Bare windows look more modern, and your neighbors will never need to ask what's new with you.
 - b) Use something like a clothespin to clip a cord to itself up high, or wrap the cord around a cleat mounted near the top of the window.
 - c) Teach your children how to use a pogo stick, so they won't have to climb on furniture to see outside.
 - d) Use colorful cords.
5. If a tornado warning is issued for your area, you should
 - a) Open all windows and doors.
 - b) Immediately go to a safe part of the building.
 - c) Turn off the main breaker to your house.
 - d) Put tape on all glass windows.

See Answers on page 7

Marshall helps rocket-building students get their project off the ground

by Marianne Higgins

Students at Fredericksburg High School in Fredericksburg, Texas, are preparing to launch a rocket they designed and built – not a model, but a real rocket – thanks in part to the Marshall Center.

The students are enrolled in the school's two-year Aerospace Program, designed to teach engineering, propulsion and aerodynamics to high school students. The highlight of the course is the design, construction and launching of a rocket capable of carrying a 35-pound payload.

In support of the advanced curriculum, the Marshall Center donated a rocket motor fuel grain and nozzle.

"As NASA's lead center for propulsion, we were delighted to support this educational project," said Marshall Center Director Art Stephenson. "We recognize that the best way to get young people excited about rockets, space and microgravity research is through hands-on programs like Fredericksburg's."

The 410-pound rocket, scheduled to launch Friday from the U.S. Army White Sands Missile Range, N.M., is called Redbird 9-H. "Red" is one of the school's colors, this is the program's ninth rocket, and "H" stands for the hybrid engine that will propel it. A hybrid engine is one fueled by solid fuel and liquid oxidizer.

The Redbird 9-H is designed to reach an altitude of 100,000 feet and carry a test payload for aerospace engineering students at the University of Texas at Austin.

"Last summer we proved we could launch, and this summer we're out to prove we can carry and deploy an experiment," said Brett Williams, creator of the Aerospace Program. "This is a proof-of-concept launch, and if all goes well, next year's students will build and launch the rocket containing the actual experiment."

"Marshall's willingness to partner with us by providing hardware is a first for us," Williams added. "I believe NASA's support and recognition of their efforts encourages the students to excel."

Williams said his program's goal is to prepare students to excel in college. But ultimately, he hopes to develop a program that will help universities inexpensively reach the edge of space for research by using his student-built sounding rockets.

NASA uses its unique resources, whenever possible, to support educational excellence, since education is a key element in the Agency's overall mission. The space agency participates in educational outreach programs through centers around the country. More information on educational opportunities with the Marshall Center can be found at:

<http://www.msfc.nasa.gov/education>

Information about NASA's education program can be found at: <http://education.nasa.gov>

The writer, employed by ASRI, supports the Media Relations Department.

Skylab: America's first space-based research facility

This is the sixth in a series of historical articles the Marshall Star will publish this summer on the history of the Marshall Center.

by Mike Wright

Launched May 14, 1973, Skylab was the first American space program wholly dedicated to scientific research, and the Marshall Center played an extremely important role in this unprecedented scientific venture.

Skylab's three different three-person crews spent up to 84 days in Earth orbit and performed a variety of more than 100 experiments. The Marshall Center developed the major Skylab components and the four Saturn launch vehicles used to launch the orbital cluster and its three separate crews. Marshall also was responsible for directing many of the experiments.

Marshall engineers designed the centerpiece component for Skylab, the orbital workshop, by converting a Saturn rocket stage into a habitable space module containing living quarters and support systems, as well as experiment areas.

Marshall assignments also included the Skylab airlock module, docking adapter and Apollo Telescope Mount, the first manned astronomical observatory designed for solar research from Earth orbit.

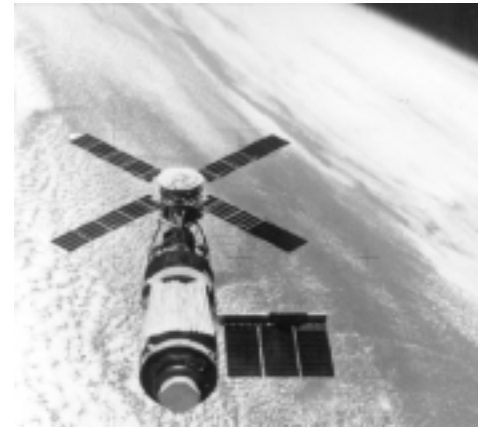
The Center also was responsible for investigations in materials processing and solar physics, and designed and built a series of Skylab biomedical experiments. Marshall also served as the NASA interface for a series of Skylab experiments proposed by students from across the country.

In 1973, NASA launched Skylab using a Saturn V rocket. Unfortunately, a huge panel protecting the orbital workshop from micrometeoroids and solar radiation ripped off seconds after the launch.

NASA had originally planned to launch its first three-person crew to Skylab on May 15 using a Saturn IB rocket. Faced with a crisis, however, NASA put those plans on hold. Rising temperatures inside the workshop and a crippled electrical power system dogged engineers at Marshall and other Centers.

Some Marshall employees stayed at their posts from dawn Monday through Wednesday looking for immediate and long-term solutions. Hundreds at the Center were involved in the relentless 10-day effort to identify the repair procedures and equipment that the astronauts eventually carried into space and used to save Skylab.

Skylab's first crew went into space May 25, 1973, and returned home June



22. A second crew was launched July 28 and splashed down Sept. 25. Repair procedures were part of both missions, but attention also focused on the scientific data that Skylab gathered. For example, the second mission orbited a pair of common spiders, Arabella and Anita. The experiment was designed to determine the spiders' ability to spin a web without the influence of gravity. It was one of the student experiments coordinated by the Marshall Center for Skylab.

The third Skylab crew went into space Nov. 16, 1973, and splashed down in February 1974, setting a new endurance record and reflecting man's ability to live and work in space for extended periods of time.

The writer is the Marshall Center historian.

SMDC headquarters to be named Von Braun Complex

The new headquarters for the U.S. Army Space and Missile Defense Command (SMDC) on Redstone Arsenal will be named after Dr. Wernher von Braun, father of the space program, according to U.S. Sen. Richard Shelby of Alabama.

"I am very pleased that my colleagues recognized the contributions made by von Braun to the U.S. space program," said Shelby, a member of the Senate Appropriations Committee. "It is both fitting and proper to name this new Redstone facility after him."

Shelby was successful in securing \$39 million in funding for the facility last month.

Marshall team to tell Center history through 40th anniversary video

As part of the Marshall Center's plans to mark its 40th anniversary, work will begin soon on a video presentation depicting various highlights in the Center's 40-year history.

The production will include actors drawn from the Marshall team, their children and retirees. Thirty-five to 50 adults are required for the production, some of whom will be required to speak on camera. It also will require about 20 children, 10 years old or older.

Interested participants should e-mail Larry Fine at: larry.fine@msfc.nasa.gov

Upcoming Events

Mandatory insurance law —

Beginning Monday, the Alabama Mandatory Insurance Law will be enforced on Redstone Arsenal.

Marshall retiree dinner — The annual dinner honoring last year's 238 Marshall retirees will be at 6 p.m. Aug. 17 at the Von Braun Center North Hall. Tickets — at \$15 each — are available through admin officers. All employees are invited.

AMPET Conference — The 4th Conference on Aerospace Materials, Processes and Environmental Technology (AMPET) will be Sept. 18-20 at the Von Braun Center in Huntsville. All Marshall employees are invited. To attend, civil servants should submit a Conference Form 1265 to CD20/Stephanie J. Elliot no later than Sept. 1. Contractors should register to attend on the Web site. More information is on the Web at: <http://ampet.msfc.nasa.gov>.

X-34

Continued from page 1

operations project manager for the Pathfinder Program — which includes the X-34. "If we have any vehicle anomalies, we want to find them in ground tests, not in flight or landing."

Within the last two weeks, the X-34 completed four successful tow tests. Last Saturday, during the fifth X-34 tow test on the dry lakebed at Edwards, test engineers observed excessive slack in the tow cable and called an abort to the test. However, the X-34 nose gear wheels became tangled in the cable. The craft's onboard computer sensed the problem, released the tow cable, deactivated nose wheel steering and applied the brakes without further incident.

Early inspections of the vehicle revealed that a nose gear tire was cut and will have to be replaced. No further damage was apparent. Engineers are evaluating the test data and doing a comprehensive inspection of the vehicle.

The writer, employed by ASRI, supports the Media Relations Department.

Promotes technical degrees for minorities

College students earn opportunity to intern at Marshall Center

Forty-nine college students from around the country earned an opportunity to work as interns at the Marshall Center this summer.

The unique opportunity is part of NASA's 10 week Equal Opportunity Summer Scholars Intern Program. The experience pairs minority and disabled college students with NASA researchers.

Students perform research and experiments, then present their findings to the Marshall employees overseeing their research.

The Summer Scholars Intern Program is sponsored by Marshall's Equal Opportunity Office, and is open to students who have a 3.0 or better grade point average, as well as a minimum score of 1,200 on the Scholastic Aptitude Test. The student's university determines other criteria.

The 49 students are part of seven different programs offering the summer job opportunities.

Abbie Green, a senior at Ohio State University in Columbus, is participating through the American Association for the Advancement of Science's ENTRYPOINT! program.

ENTRYPOINT! places students with disabilities in math, science and engineering related internships. The association has a partnership with NASA's Achieving Competency in Careers in Engineering and Space Science program.

Sixteen Huntsville area students are participating under the Minorities in Science and Engineering (MISE) program. The University of Alabama in Huntsville, Alabama A&M University in Normal and Oakwood College in Huntsville sent students under the MISE program.

Under its Strategic Preparedness in

See related story on page 5

Advancing Careers in Engineering (SPACE) program, Morehouse College in Atlanta has nine students participating. All program participants are Ronald E. McNair Scholars, named for the late Space Shuttle Challenger astronaut.

Five students are participating through the Undergraduate Scholar Awards for Research (USAR) program offered at the University of Texas at San Antonio and New Mexico Highlands University in Las Vegas, N.M.

Ten summer interns from Spelman College in Atlanta are participating through Spelman's Women in Science and Engineering (WISE) program.

Seven summer scholars from Florida A&M University in Tallahassee are participating through IMAGE — Increasing Minority Access to Graduate Engineering — a program designed to boost the number of minority engineers seeking advanced degrees at Florida A&M.

Two students, one from the Inter America University of Puerto Rico in Bayamon, and the other, a recent graduate of South Texas Community College in McAllen, Texas, are participating through the Langley Aerospace Research Summer Scholar program (LARSS).

The program is designed for college juniors, seniors and first-year graduate students. Although most students perform their work at Langley Research Center in Hampton, Va., some interns are placed at other NASA Centers such as Marshall.

Marshall launches mentorship program with local universities

by Marianne Higgins

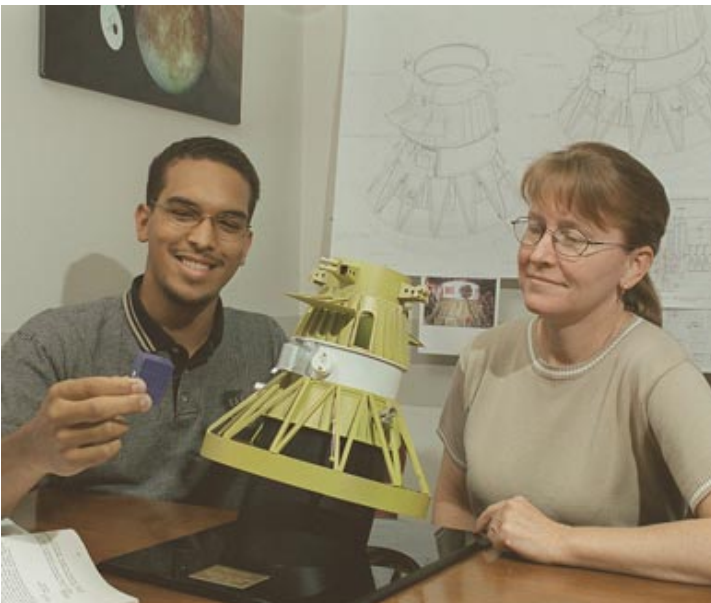
When experiments get under way on the International Space Station, Earth-bound scientists whose research projects are aboard the orbiting lab will be using software that was developed and thoroughly tested by the Marshall Center.

And one of the experts who's been putting the software through the wringer to make sure it works flawlessly is Huntsville college student Otutu Kamalu.

"This is the opportunity of a lifetime," said the computer science major at the University of Alabama in Huntsville (UAH). "My NASA mentor has turned me loose to make something work, and I'm loving the challenge."

Kamalu's summer experience is part of NASA's 10-week Equal Opportunity Summer Scholars Internship Program, which pairs minority and disabled college students with NASA researchers and engineers as mentors. Students perform research and experiments, then present their findings.

He is participating through the Minorities in Science and Engineering Program (MISE), a program launched this summer for students at UAH, Alabama A&M University in Normal, and Oakwood College in Huntsville.



Maycock, left, works with Leslie Curtis of Marshall's Space Transportation Directorate.

"As a computer science major, it's important for me to understand software and why it works or fails," said Kamalu, of Huntsville. "My mentor is allowing me to be a 'consumer product tester' for this Space Station software — to make sure it works correctly, easily, quickly and securely. Space may be a one-shot deal for some scientists, so it has to be right the first time, and I love the fact that I can be a part of their success."

Kamalu is one of 12 MISE summer scholars being mentored at Marshall this summer.

Nicole Green, a physics and math major from Alabama A&M, is researching future space technologies during her summer at the Marshall Center.

"I'm assisting with a computerized presentation about what's on NASA's drawing board," said Green, of St. Louis, Mo. "My mentor Jonathan Campbell of Marshall's Engineering Directorate, has shown me how important it is for scientists and engineers to communicate their ideas to others, and it's fascinating."

Proving Einstein's Theory of Relativity is not Shayla LaCount's responsibility, but she is involved in explaining it to teachers and the public, and that's no small challenge either. She is developing a CD-ROM about NASA's Gravity Probe-B project — a spacecraft scheduled to launch in two years which could prove space and time are distorted by the presence of massive objects.

"I've never had a mentor who cared so much about



Photos by Dennis Olive, NASA/Marshall Space Flight Center

Kamalu, right, works with his mentor, Michael Nelson of Marshall's Flight Projects Directorate, on Payload Information Management Systems.

teaching me every aspect of a project," said the Oakwood math major who's from Chandler, Ariz. "This is a nurturing and well-structured internship, and I'm inspired to someday teach."

Other scholars from Oakwood are Samuel Acoff of Selma, Ala.; Landon Dowe of Birmingham, Ala.; Bruce Guy of Nobelsville, Ind.; Antoine Maycock of Huntsville; and Catherine Taylor of Boyertown, Pa.

Other scholars from Alabama A&M are George Baker of Harvest, Ala.; William Dillard of Huntsville; Roderick Sims of Franklin, Ala.; and Shawnesy Summers of Blue Mountain, Ala.

Marshall's Equal Opportunity Office sponsors the Summer Scholars Internship Program. It is open to students who have a 3.0 or better grade point average as well as a minimum score of 1,200 on the Scholastic Aptitude Test. A student's university determines other criteria.

The writer, employed by ASRI, supports the Media Relations Department.

Marshall employees should exercise proper business etiquette when using cellular phones, pagers

by Information Services Department

Good manners are not just for social occasions. In today's fast-paced business world, practicing appropriate business etiquette can make a big difference in the way an employee is perceived — by management, by customers and by co-workers.

People are sometimes unaware of the impact of their actions on the people they meet with during the workday.

Pagers are now as common as a briefcase in the office environment, and their "beeps" are irritating and disruptive when they interrupt a conversation or meeting. Cellular phones are prone to ring at the most inconvenient times, especially if they are taken into a situation where a call would be inappropriate. Common courtesy dictates that these devices must be regulated for use in business settings.

Because of the widespread availability of cellular phones and pagers in the workplace, probably everyone has inadvertently used these devices in a way that causes a disruption, irritation or inconvenience

to others. Individuals need to be aware of how to use electronic devices in the business arena, and they need to understand how improper use of these devices can cast a negative shadow on their professional image.

In business settings

- If you use a pager or cellular phone, it is recommended you wear it, but always keep it exclusively in the "vibrate" mode in any business setting. Do not carry the pager or cell phone in your purse or inside your briefcase, and do not lay it on a tabletop. A vibrating pager loose on a tabletop is very distracting to others. If your pager or cell phone does not have "vibrate" capability, turn them off in business meetings.

- When moving your cellular phone from your car to the office environment, make a habit of checking to ensure that it is set on "vibrate" mode. Receiving a call/message in the silent "vibrate" mode is the most important step in practicing proper business etiquette in the use of these devices.

allow a quick exit.

- Be sensitive to the value of a customer's time. If you allow a cellular phone call to interrupt a face-to-face meeting, the message that you have sent is that the customer's time is less valuable than the caller's time. If that message is not correct, you may never get the chance to fix it. Add voice mail to your cellular phone service and return the call when it is convenient.

- Safety Moment: Do not drive while talking on your cellular phone. If you need to immediately communicate via cellular phone, find a safe parking area and then continue the conversation. Many state and municipalities have already enacted legislation making it illegal to hold a cellular phone in a communications mode while driving. These states and municipalities permit a "hands-free" headset but these still impair your ability to drive and concentrate on driving.

Non-business settings

- Ensure that your cellular phone or pager is in the "vibrate mode" in any public setting such as restaurant, movie, theater performance, classroom, seminar, sporting event, romantic date or concert hall.

- Turn your cellular phone or pager off — or leave them secure in your automobile's glove compartment — during a funeral, wedding or religious service. It is not worth taking the chance that you forgot to set it for "vibrate" mode in these settings.

- Turn off your cellular phone or pager where it may interfere with critical electronic devices as posted on placards in certain airport/airplane, construction site and hospital areas.

While the use of electronic devices always requires a little thought, you should be practicing proper business etiquette on cellular phones and pagers on a regular basis.

For more information, call Chet Young at 544-3647.



Photo by Danny Reeves, NASA/Marshall Space Flight Center

Buddy Roberts of PrISMS Wang, seated, shows Muse Mann, left, of PrISMS Computer Sciences Corp. and Chet Young of the Information Services Department several new features of the tri-mode cell phone. These phones will support enhanced features that will benefit the Marshall user community.

- If you need to answer an urgent business call/message in a meeting, excuse yourself quickly and quietly so that you provide minimal distraction. Pay close attention that you open and close doors quietly to further minimize distraction. If you know that you may receive an urgent business call/message during a meeting, sit in a position near a door that will

Bar codes

Continued from page 1

storing as much as 100 times the information as a bar code — and in the same amount of space. The symbol is a small, square-shaped mark resembling a checkerboard. Unlike a bar code, which is scanned using a laser beam, the symbol is captured by a charged-coupled device (CCD), a solid-state chip that turns light into electric signals.

In 1997, the Marshall Center moved to introduce the permanent marking aspect of this technology into the commercial sector. Marshall formed an alliance with the developer of the “Data Matrix” symbol CiMatrix, a Canton, Mass., firm, and its parent company Robotic Vision Systems, Inc. (RVSI), to develop commercial applications for NASA’s marking technologies.

The symbols have begun appearing on items used every day, said Don Roxby, director of CiMatrix’s Symbology Research Center. “Because of their versatility, Data Matrix symbols are on a wide variety of products — household items like Colman’s English Mustard, Mennen Speedstick, Wyeth-Ayerst vitamins and Kodak film.”

The technology has become the method of choice for direct-part marking in the automotive, health, semi-conductor, aircraft and electronics industries, he said.

“Before this technology was available, computer chip manufacturers had no way of marking their products, and counterfeit and stolen chips flooded the market,” Roxby said. “The same is true with other small electronic parts. With Data Matrix, companies can place permanent marks on their components — an obstacle to

thieves and counterfeiters.”

But it doesn’t stop there, said Schramm. NASA has part identification needs that go beyond marks that can be seen.

Markings might be covered by paint, cork, foam or other protective coatings. Patents are pending for six methods of reading the symbols under coatings, through containers or within an assembly.

“This identification process will have untold implications for industry, as well as NASA,” Schramm said. “New marking methods — possibly ready this year — should open the door to marking parts that must operate under extreme pressure, in some cases, thousands of pounds per square inch.”

The writer, employed by ASRI, supports the Media Relations Department.



Photo by Doug Stoffer, NASA/Marshall Space Flight Center

Matrix symbols are capable of storing as much as 100 times the information as a bar code — in the same amount of space.

Answers

Continued from page 2

1. b) If the victim is not in danger of further injury, the victim should not be moved until emergency medical experts arrive. Moving the person unnecessarily can cause additional harm. The person should be covered with a blanket, if possible, to prevent the onset of shock and also to keep the person warm until help arrives. Ask the victim personal information, such as his or her name, if it is not known. This should be done in case the person passes out so you can relay the information to the police and medical team.

2. c) About 100 people die each year in the United States as the result of being struck by a lightning bolt.

3. f) All of the above activities can require repetitive motion. Pain from cumulative trauma may appear days or years later. If you are performing repetitive motion tasks, frequently change the type of task you’re performing or take frequent breaks.

4. b) Use something like a clothespin to clip a cord to itself up high, or wrap the cord around a cleat mounted near the top of the window.

5. b) Immediately go to a safe part of the building.

If you would like to join the Marshall Safety and Health Action Team, call Joel Best at 544-3788. For more Safety Bowl questions, see “Inside Marshall,” “The Daily Planet” and ETV.

Obituaries

Brightwell, Wanda T., 77, of Huntsville, died July 9. She retired from Marshall in 1984 where she worked as an accounting technician.

McCormick, Murphy B., 78, of Huntsville, died July 13. He retired from Marshall in 1970 where he was a mechanical equipment quality control representative. He is survived by his wife, Erlene F. McCormick.

Watters, Harry H., 63, of Huntsville, died July 14. He retired from Marshall in 1992 where he worked in technology utilization. He is survived by his wife, Judy H. Watters.

Cobb, William A., 67, of Huntsville, died July 23. He retired from Marshall in 1987 where he worked in technical management.

Employee Ads

Miscellaneous

- ★ Bontempi Model B10 electric chord organ, \$25. 882-8684
- ★ Bougainvillea plant, pink flowers; 6 ficus trees; wisteria; \$15 each w/o pots and saucers. 881-6040
- ★ Women's fingerless athletic gloves, \$7; waterbed w/platform, heater, etc., \$35; Korlach mountaineering boots, size 10, \$40. 534-1461
- ★ Craftsman 9" table saw on legs. 880-0880
- ★ Wood desk, heavy duty, computer workstation, 6-drawer, walnut color, 30-1/2x60 plus 18x41 wing, \$75. 883-2948
- ★ Heavy duty Kitchen Aide washer/Sears dryer, sell as pair only, \$150. 230-6846
- ★ Canon EOS Rebel G camera, \$125; student desk and matching bookcase, \$100. 859-5475
- ★ Lawn fertilizer, Scotts & Vigoro, 28-3-3, 15-lb. bags, \$7.50 per bag. 325-6000
- ★ Fabric couch/love seat, floral on gray, \$125 for both; vacuum/attachments, \$25; VCR, \$20; car seat, \$25. 881-4148
- ★ Chocolate lab puppies, 5 weeks old, excellent pedigree. 534-8176
- ★ Ping pong table w/four paddles & almost new net, \$25. 837-2267
- ★ Sony VA10 266MHz, 32MB, 4.3GB, 24x, K56 computer and monitor \$1,000. 722-9483
- ★ Queen-size sofa sleeper, \$175 obo; sofa, \$150; 2 matching chairs, \$125 each. 721-2641 after 6 p.m.
- ★ Fireplace insert, "Ambassador", \$275. 830-6584
- ★ Full-size bed w/mattresses and rails, dresser with mirror, and chest, light brown, \$400 obo. 519-2735
- ★ Carver 28'-4" fiberglass cabin cruiser, Flybridge, twin inboard V8 engines, head galley, low hours, \$17,995. 536-6219
- ★ Kelvinator washer and dryer, 10 yrs. old, \$175. 353-7847
- ★ Maytag trash compactor, portable or built-in, multicolor door panel, \$110. 883-4276
- ★ Smith & Wesson shotgun, 1000M, 12 gauge, 3" w/30" full choke, additional barrel: 2 3/4" chamber w/28" modified,

\$355. 379-3606

- ★ Mink jacket, medium brown, size 10, smooth not ribbed, \$1,700 obo. 931-937-6752
- ★ Palm Pilot IIIxe, 8M memory, HotSync cradle, Palm Desktop 3.1, 2 months old, cover, documents & box, \$175. 895-0925

Vehicles

- ★ 1999 GMC Safari van, dual power seats, windows, locks, 9,500 miles, under NADA, \$18,995. 883-7348
- ★ 1989 GMC Jimmy 5-15, one-owner, five speed, 111K miles, red, \$3,500. 837-0559
- ★ 1996 Mazda 626 LX, V-6, 63.5K miles, 25 mpg, white, 5-speed, \$9,200. 574-5098
- ★ 1995 Mustang GT 5.0, 5-speed, forest green, leather, 78K miles, \$10,500 obo. 864-2655
- ★ 1970 Chevrolet Impala convertible, cream color w/black top, \$3,600. 582-0663
- ★ 1993 Dodge Grand Caravan SE, one-owner, many new parts, service records available, \$6,000. 895-9520
- ★ 1994 Nissan Sentra, automatic, 96K miles, red, 4-door, am/fm tape, PW/PL, \$3,950. 464-0660
- ★ 1997 Saturn SC2, automatic, CD, sunroof, leather, silver, all options, 53K miles, \$8,500. 880-9025
- ★ 1995 Chrysler Concorde, burgundy, 3.5L, V-6, 74K miles, \$7,900 obo. 881-6388
- ★ 1992 Dodge Grand Caravan LE, blue, 3.3L, V-6, 104K miles, \$4,900 obo. 881-6388
- ★ 1989 Blazer S-10, 165K miles, white, 2-door, V-6, air, automatic, moon roof, \$2,450. 883-8947
- ★ 1997 Pontiac Firebird convertible, black, 34K miles, all power, CD changer, warranty, \$16,500. 890-9147

Free

- ★ Two beautiful, declawed, spayed, litter trained, long-haired cats, all shots; allergic. 351-0869 after 6:30 p.m.

Found

- ★ Key and 2 video tapes. Call 544-4758 to identify

Lost

- ★ Brown zip-up leather binder in Bldg. 4610 parking lot. Call 430-5345 if found.

Center Announcements

- ✦ 'answers' for survivors — The NASA Exchange is offering a book that can help you plan for those you leave behind. "answers" is a practical survival kit to help you organize personal and financial matters. The 80-page, fill-in workbook can be ordered through the Exchange for \$24.95. Deadline for ordering is Aug. 11. For more information, call 544-2185.
- ✦ Bahamas Vacation Cruise — Executive Tour and Travel Services, Inc. is offering a Bahamas Vacation Cruise-N-Stay package for Marshall employees, retirees and on-site contractors for \$189 per person, based on double occupancy. For more information, call 1-800-272-4707.
- ✦ MARS Luau Dinner Dance — A Luau dance will be at 6:30 Aug. 12 at the Von Braun Center East Exhibit Hall. For tickets call Linda Kinney at 544-0563, Tamara Landers at 544-6818, Pat Sage at 544-5427, Ed Ogozalek at 837-1486 and Bob Williams at 544-3998.

Sports

Tennis Tournament — The MARS Tennis Club will host a "Women's Open Doubles Tournament" Aug. 12, beginning at 8:30 a.m., with warm-up starting at 8 a.m. Open Doubles means each female member can invite a guest as her partner, and pay a guest fee of \$3. To participate, call Bernice Bowling at 544-0453.

Job Opportunities

CPP 00-79-CL, Supv, AST, Aerospace Flight Systems, GS-861-15, Flight Projects Directorate, Flight Systems Department, ECLSS Group. Closes Aug. 8.

CPP 00-105-DS, IFMP Training Program Manager, GS-301-14, Customer and Employee Relations Directorate, IFMP Training Program Office. Closes Aug. 9.

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